

Delayed Cranial Progression of Pure Spinal Spontaneous Intracranial Hypotension: A Case Report

Case Report

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Abstract

Background: Spontaneous intracranial hypotension (SIH) typically presents with orthostatic headache and characteristic intracranial MRI features. A rare pure spinal variant exists in which both symptoms and imaging abnormalities are limited to the spine. Long-term outcomes of this subtype are poorly described.

Case Presentation: A 52-year-old male initially presented with progressive upper-limb weakness without orthostatic headache. Cranial MRI was normal, while spine MRI showed ventral epidural CSF collection and venous engorgement, consistent with pure spinal SIH. He remained clinically stable for nearly five years. He later developed sudden onset headache and vomiting; imaging revealed a subacute right convexity subdural hematoma with midline shift, indicating delayed cranial progression.

Conclusion: Pure spinal SIH may appear benign initially, but delayed cranial complications can occur years later. Long-term surveillance and early treatment may prevent serious outcomes such as subdural hematoma.

Keywords: SIH; Orthostatic headache; Acute subdural hematoma

Introduction

Spontaneous intracranial hypotension (SIH) is caused by reduced CSF pressure or volume, most commonly due to a spinal CSF leak [1]. Typical clinical features include orthostatic headache and characteristic intracranial MRI findings such as pachymeningeal enhancement, venous engorgement, and brain sagging [2]. The estimated incidence of SIH is 5 per 100,000 individuals [3].

Spinal manifestations occur in approximately 6% of cases and may present as radiculopathy or myelopathy [4], usually in conjunction

with cranial symptoms. A rare clinical entity, pure spinal SIH, has been described in which the presentation and imaging abnormalities are confined entirely to the spine, with normal cranial studies [5].

Long-term follow-up data for pure spinal SIH are scarce. We present a case that remained neurologically stable for nearly five years before developing an acute subdural hematoma, representing delayed cranial progression.

Case Presentation

A 52-year-old male 5 years ago presented to neurology

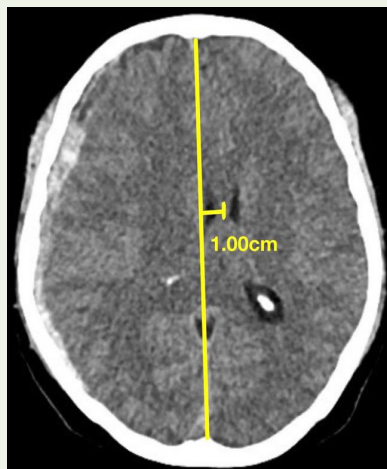


Figure 1: CT brain showing subacute subdural hematoma in right cerebral convexity with mass effect on right lateral ventricle and midline shift of 10mm to left side.

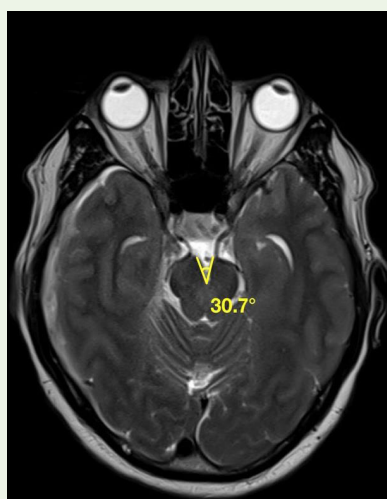


Figure 2: MRI brain T2 weighted axial section showing reduced interpeduncular angle.

department with neck pain, bilateral arm weakness and proximal muscle atrophy. His imaging studies showed ventral epidural CSF collection in cervical spine C3 to C5 levels. His cranial imaging at that time was normal. A diagnosis of pure spinal SIH was established. He was treated conservatively with bed rest, hydration, and analgesics; no epidural blood patch was performed. His symptoms remained stable. Now he presented with 2 days history of gradually progressive right sided severe headache, vomiting and drowsiness. There was no history of trauma, spinal intervention, or orthostatic headache. Patient was drowsy (E3V4M6) and had signs of raised ICP.

He was evaluated with CT brain which showed subacute right cerebral convexity subdural hematoma with mass effect on right lateral ventricle and midline shift towards left side (FIGURE-1). His MRI brain demonstrated reduced inter-peduncular angle of

30.7°--(normal angle measures more than 40.5° and values less than 40.5° indicating intracranial hypotension [6]), consistent with intracranial hypotension. MRI spine showed cervical spinal ventral epidural CSF collection from C2 to C5 level.

He had Hypertension and Dyslipidaemia; other laboratory parameters were unremarkable. The patient underwent mini-craniotomy and evacuation of subacute subdural hematoma followed by autologous epidural blood patch. He was planned for second patch two weeks later.

CT and MRI imaging

Axial section of CT brain shows subacute right cerebral convexity subdural hematoma with mass effect on right lateral ventricle and midline shift towards left side (FIGURE-1). MRI brain T2 weighted axial section showing reduced inter-peduncular angle (FIGURE-2). MRI spine T2 weighted sagittal and axial sections of cervical spine shows ventral epidural CSF collection from C2 to C5 level (FIGURE-3).

Discussion

Spontaneous intracranial hypotension (SIH) is increasingly recognized as a disorder of spinal CSF leakage rather than simply a syndrome of low intracranial CSF pressure. Although orthostatic headache and characteristic intracranial MRI abnormalities are the classical manifestations, the clinical spectrum is considerably broader.

The entity described as pure spinal SIH represents an uncommon phenotype in which clinical symptoms and radiological abnormalities are initially confined to the spine, without the typical cranial manifestations of SIH[5]. Our patient demonstrated this unusual phenotype, with a cervical ventral epidural CSF collection, upper-limb weakness and muscle wasting, in the absence of orthostatic headache and with normal initial cranial imaging.

Delayed intracranial complications in pure spinal SIH are rarely reported. Chronic CSF leakage produces persistent intracranial hypotension, leading to brain descent, stretching of bridging veins, and subsequent subdural hematoma formation.

This case reinforces several key concepts:

- Normal brain MRI does not exclude future risk of intracranial

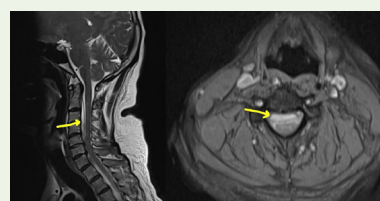


Figure 3: MRI spine T2 weighted sagittal and axial sections of cervical spine shows ventral epidural CSF collection from C2 to C5 level.

complications.

- Persistent spinal CSF leaks may lead to delayed cranial manifestations despite clinical stability.
- Early intervention-targeted epidural blood patch or surgical repair-may prevent progression to subdural hematoma.
- Long-term follow-up with periodic cranial imaging should be considered in patients diagnosed with pure spinal SIH.

Conclusion

Pure spinal SIH should not be considered benign despite the absence of cranial findings at presentation. Significant delayed intracranial complications such as subdural hematoma may occur even after years of stability. Long-term monitoring and early treatment of CSF leaks are essential to prevent morbidity.

Author Consent

Declaration originality, competing interest, and authorship on behalf of all authors.

On behalf of all authors, I declare that this manuscript is original, has not been published previously, and is not under consideration

for publication elsewhere. All authors have made substantial contributions to the work, have reviewed and approved the final version of the manuscript, and agree to its submission to the journal. The authors declare that there are no competing interests, financial or otherwise, that could have influenced the work reported in this manuscript.

References

1. Upadhyaya P, Ailani J (2019) A review of spontaneous intracranial hypotension. *Curr Neurol Neurosci Rep* 19: 22.
2. Cheema S, Mehta D, Qureshi A, Sayal P, Kamourieh S, et al. (2024) Spontaneous intracranial hypotension. *Pract Neurol* 24: 98-105.
3. Schievink WI (2006) Spontaneous spinal CSF leaks and intracranial hypotension. *JAMA*. 295: 2286-2296.
4. Schievink WI, Chu RM, Maya MM, Johnson JP, Cohen HC (2013) Spinal manifestations of spontaneous intracranial hypotension. *J Neurosurg Spine* 18: 96-101.
5. Löscher W, Hofer A, Wanschitz J, Stark R, Grams A (2015) Hand amyotrophy and ventral intraspinal fluid collection. *Amyotroph Lateral Scler Frontotemporal Degener* 16: 1-2.
6. Wang DJ, Pandey SK, Lee DH, Sharma M (2019) The Interpeduncular Angle: A Practical and Objective Marker for the Detection and Diagnosis of Intracranial Hypotension on Brain MRI. *AJNR Am J Neuroradiol* 40: 1299-1303.